

Different coat color may not mean different species for lemurs

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Mouse lemurs with distinct coat colors and shared genetics. Credit: L. R. Godfrey

Researchers have found that lemurs suspected to belong to different species because of their strikingly different coat colors, are not only genetically alike, but belong to the same species.

Historically, species classification has been based on comparison of visible physical characteristics of plants or animals. Kellie Heckman, a post-doctoral fellow in ecology and evolutionary biology at Yale, and her colleagues at other universities, used analysis of a mitochondrial gene, cytochrome b, to test the genetic relationship of 70 lemurs that were thought to belong to up to three different species. Their report was published in the open access journal *BMC Evolutionary Biology*.

"Our study combined morphological, genetic, geographic, and ecological data giving a multidimensional, and hopefully more accurate picture of species diversity," said Heckman. "Over the past decade, the number of proposed species of these lemurs has jumped from two to fifteen, based on physical differences. It pointed to the need for caution when identifying new species solely on the basis of visual or genetic characteristics."

The lemurs they tested had three extremely different coat colors and lived in different types of forest locations in southern Madagascar -- classic characteristics of separate species. These researchers chose to compare mitochondrial cytochrome b as a gene marker that is known to change at a rate similar to that of speciation. Other common nuclear genes may evolve more slowly or more rapidly with population drift.

Surprisingly, the researchers found that although the lemurs appeared to be different species because they were visually distinct, they did not differ genetically. According to the sequence of their cytochrome b genes, all belong to the same previously identified species, *Microcebus griseorufus*.

The authors also show that lemurs with each of the three different coat colors could be found in all three geographical locations in similar proportions. They note that lemurs are nocturnal animals and tend to depend on auditory cues, or smell, more than on visual cues to recognise each other. They say that this could explain why a certain amount of variation in coat color does not affect species recognition in the mouse lemurs.

"There is a remarkable amount of diversity in primates," said Heckman. "We wanted to more thoroughly document this with both morphologic and genetic analysis."

Source: Yale University

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